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Parental involvement in sexuality education: advancing understanding through an analysis of findings from the 2010 Irish Contraception and Crisis Pregnancy Survey

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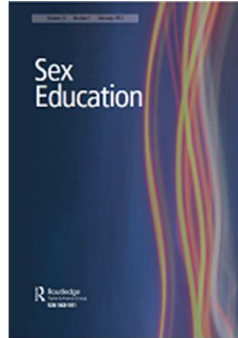
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Improving research on parental involvement in sexuality education: Findings from the [name removed to protect the integrity of the review process]

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Manuscripts

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3 **Parental involvement in sexuality education: advancing understanding**
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6 **through an analysis of findings from the 2010 Irish Contraception and Crisis**
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8 **Pregnancy Survey**
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Abstract

Recent research has highlighted the importance of parental involvement in sexuality education, and studies of sexuality education sometimes take place via national sexual health surveys. This paper aims to identify key parental characteristics that predict parental involvement in sexuality education while also encouraging debate on how this topic is optimally investigated. Data were a subset from a nationally representative cross-sectional telephone survey of adults (18-45 years) living in Ireland (N=3002). Parents (21-45 years) of a child/children aged 6 years or older at the time of the study ($n=966$) were included in analyses. Results using propensity score analysis found that parents who reported engaging in sexuality education with their children were more likely to be women, aged 36-45 years, and have a larger number of children. Advancing the field of sexuality education research could be facilitated by the application of survey method and the advanced statistical techniques used here. Furthermore, a stand-alone national survey assessing parental involvement in sexuality education would be a worthy contribution to this knowledge base.

Keywords: sexuality education; parental involvement; sexual health; national surveys; propensity score analysis

Introduction

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2
3 A key aim of sexuality education is to provide young people with essential knowledge and skills
4 that will enable them to make empowered and healthy decisions about their sexual health and
5 relationships (Loeber, Reuter, Apter, van der Doef, Lazdane, and Pinter, 2010). National studies
6 assessing the receipt of sexuality education generally embed questions within a broader
7 assessment of sexual health. For example, both the Irish Study on Sexual Health and
8 Relationships (Rundle, Layte and McGee 2008) and the UK National Survey of Sexual Attitudes
9 and Lifestyles II (National Centre for Social Research et al. 2005) included questions that asked
10 participants about learning about sex when they were growing up. In addition parents
11 involvement in sex and relationships education is recognised by law in some countries (e.g. UK
12 Education Act 1993; Article 42 of the Irish Constitution) (Parker, Wellings, and Lazarus 2009).
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28 Parental involvement in a child's education is an important factor influencing academic
29 achievement and growth (Fan and Chen 2001). A number of key socio-demographic factors have
30 been identified. Gender plays a role, with mothers more likely than fathers to be involved in
31 school-related activities (Phares Fields and Kamboukos 2009). Parents who are socio-
32 economically deprived have been found to participate less in their child's education possibly
33 because they tend to have fewer years in formal education or they may have had more negative
34 experiences within the education system (Boethel 2003). Byrne and Smyth (2010) also report
35 that the more education a parent has, the more likely they are to be involved in their own child's
36 education.
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50 Whereas research on factors that influence the level of parental involvement in a child's
51 sexuality education is not as extensive, it has reached broadly similar conclusions. For example,
52 mothers have been found to be more likely to provide sexuality education to their children than
53 have fathers (Holland, Mauthner and Sharpe 1996; Turnbull, van Wersch and van Schaik 2008;
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3 Sprecher, Harris and Meyers 2008; Walker 2001). Walker (2004) suggests that this is likely
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5 because women are broadly the primary care-givers and often the main health educators in the
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7 home. Walker (2004) also conducted an analysis of three key studies in this field and classified
8
9 the factors that influence whether parents provided sexuality education in the home under four
10
11 main categories: parents' sexual health careers (e.g. parents past sexuality education, parents
12
13 own beliefs and morals); family structure and profile (e.g. sex of the parent, socio-economic
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15 status (SES), education); family ethos (e.g. personal and social origins of the family); and other
16
17 sources of sexuality education (e.g. school, peers etc.). Other characteristics include knowledge
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19 and comfort when talking about sexuality with their children (Byers, Sears and Weaver 2008);
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21 and parents' own experience of sexuality education (Walker 2001; Byers et al. 2008). Other
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23 research has indicated that older parents are more likely to report extensive parent-child
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25 communication in relation to sexual health topics (Byers, Sears and Weaver 2008).
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33 Parents largely concur with the idea that they should play a fundamental role in their
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35 children's sexuality education; indeed, 95% of parents in one national UK study felt that
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37 discussing contraception with their children was primarily their responsibility (Ingham 2002).
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39 However, only 58% of those parents had actually done so, suggesting that these beliefs are not
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41 always reflected in practice (Ingham 2002). Although family structure and profile can influence
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43 whether parents provide sexuality education in the home, parents are not a homogenous group
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45 (Walker 2004). Efforts to increase parental involvement in sexuality education must be evidence-
46
47 based and move beyond the elucidation of background characteristics that identify suitable target
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49 groups for health promotion campaigns. In Ireland, these efforts are compounded by the fact that
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51 the provision of sexuality education in schools has only been mandatory since 2003 (Maycock,
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53 Kitching and Morgan 2007). Furthermore, as is the case for many European countries, the
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3 influence of the Roman Catholic Church in Ireland is likely to affect the provision of sexuality
4 education to children both at home and school (Wellings and Parker 2006).
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9 Against this backdrop, the authors aim to identify key parental characteristics that predict
10 whether a parent reports providing sexuality education to his/her children, using data from a
11 large national sexual health survey and the application of a novel statistical technique. In
12 addition, we aim to encourage debate on how information relating to parental involvement in
13 sexuality education can best be investigated.
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20 21 **Method**

22 23 *Survey*

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28 The sampling frame was data from the 2010 Irish Contraception and Crisis Pregnancy Survey
29 (ICCP-2010, McBride, Morgan and McGee 2012a), a nationally representative cross-sectional
30 telephone survey of adult men and women living in Ireland in 2010 aged 18-45 years (N = 3002).
31
32 ICCP-2010 assessed knowledge, attitudes and behaviours in relation to sex, contraception and
33 pregnancy. Quota sampling was used to ensure that the sample was representative of the general
34 population. Detailed survey methodology is available elsewhere (McBride, Morgan and McGee
35 2012b). Respondents were interviewed using both landline and mobile telephones. Telephone
36 numbers were randomly generated using random digit dialling (RDD). Interviews were
37 conducted using computer-assisted telephone interviewing (CATI). Experienced and trained
38 female researchers carried out the interviews. The overall response rate for the survey was 69%
39 (79% for the landline strand and 61% for the mobile telephone strand).
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Sample description and variables of interest

Demographic characteristics

Only respondents who were parents to a child/children aged 6 years or older at the time of the study (n=966) were included in analyses. Key socio-demographic variables of interest were: gender (men (reference category) vs. women); current age (binary coded as 21-35 years (reference category) vs. 36-45 years); education level (binary coded as pre-Leaving Certificate level (i.e. non-completion of second level or leaving school before aged 17) and Leaving Certificate level or higher (reference category; i.e. completion of second level or leaving school aged 17 or over); current relationship status (coded as married (reference category), cohabiting, steady relationship not cohabiting, casual relationship, or not in a relationship); number of children; locality (binary coded as urban (reference category) or rural); and social class (coded as SC 1-2 including professional workers and managerial and technical workers (reference category); SC 3-4 including non-manual and skilled manual workers; SC 5-6 including semi-skilled and unskilled workers; and SC 7 which included all others including never worked and long-term unemployed). Religiosity was also included as a demographic variable as determined by parents indicating how important religion was to them on a 5-point Likert scale, ranging from 'very important' to 'not at all important'.

History of sexuality education received and sexuality education provided

Parents were asked whether they had received sexuality education while growing up ('around the ages of 10-16 years') (binary coded as yes or no). Whether parents provided sexuality education to children was recorded by asking parents if they (or their partner) had ever talked to any of their children about sexual matters (binary coded as provided sexuality education versus did not

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3 provide sexuality education). It is important to note that even though the question asked whether
4 the respondent or their partner had spoken to any of their children about sexual matters, the
5 demographic information presented apply specifically to the respondent.
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11 12 13 14 ***Rationale and analytic plan*** 15

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18 This study investigates the factors that predict whether parents provided sexuality education to
19 their children. Ideally, the predictive effect would be assessed by randomly assigning parents to
20 treatment (those who received sex education) and control (those who did not receive sex
21 education) groups, so that the effect of background characteristics on the outcome variable could
22 be controlled for. Whereas designing studies in this way is not always practical or ethical,
23 propensity score matching offers a quasi-experimental design that can isolate treatment effects
24 on an outcome variable using observational data (McCrorry and Layte 2011; Rosenbaum and
25 Rubin 1985; Rudner and Peyton 2006). In sum, propensity score analysis (PSA) can be used to
26 control for selection bias in cross-sectional studies.
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40 Propensity score matching estimates a propensity score by combining all covariates of
41 interest into a single (propensity) score using a binary logistic regression predicting treatment
42 group membership. This is done on the assumption that the ‘treatment group’ (parents who
43 received sex education) will differ from the ‘control group’ (parents who did not receive sex
44 education) on a number of variables and that these variables may also predict the outcome
45 variable (provided sexuality education to their child/children). These potential confounding
46 variables (covariates) estimate a propensity score (ranging from 0 to 1) that represents each
47 participant’s probability of being assigned to the treatment group. This propensity score is then
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3 used to create a matched sample of treatment and control participants. Thus, the propensity score
4 is a balancing score of covariates, meaning the distribution of the covariates are the same for the
5 treatment and control group. The covariates of interest in this study were: gender; current age;
6 locality, education level; current relationship status; number of children; social class; and
7 religiosity.
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16 The first step in the PSA is to assess the differences between the two groups of interest on
17 all covariates. Previous research strongly suggests that t-test scores can be misleading, due to
18 statistical significance being partially influenced by the sample size (Rosenbaum and Rubin
19 1985; Austin 2008; Loughran et al. 2010). Therefore, the initial step is to determine the level of
20 covariate imbalance by calculating the average difference in means, as a percentage of the
21 average standard deviation (i.e. subtract the mean value of the covariate for the control group
22 from the mean value of the covariate for the treatment group and divide that difference by the
23 square root of the average variance across the treatment and control group and then multiple the
24 result by 100). Rosenbaum and Rubin (1985) suggest that a standardised absolute difference
25 equal to or greater than 20% is an indication of imbalance. Results suggested that current age
26 was imbalanced in the original full sample (before matching). This imbalance provided
27 validation for the next step in this technique, propensity score matching.
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45 After obtaining the propensity scores for each participant, a matching algorithm is
46 utilized to match the treatment and control groups. In this study, full matching (Guo and Fraser
47 2010) was used which minimizes the total distance between treatment and control groups on
48 their propensity scores. This allows the matching of parents who did and did not receive
49 sexuality education, based on their propensity scores. The following formula (Rosenbaum and
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3 Rubin 1985, D'Agostino 1998) was used to determine the percentage difference in bias reduction
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5 for initially imbalanced covariates:
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$$100(1 - b_m / b_i)$$

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11 where b_i and b_m are the treatment and control covariate mean differences after matching and
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13 before matching, respectively.
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17 With this new matched sample, logistic regression analysis was then performed to
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19 investigate what characteristics would predict whether parents provided sexuality education. The
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21 “Match It” package in R (Version 2.14.1) was used to perform the ‘full matching’ for the PSA
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23 while all other analyses were carried out using PAWS Statistics 18.0.
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31 Results

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33 The comparison of parents who reported that they or their partner had (n=475) or had not
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35 (n=488) spoken to their children about sexual matters on the key socio-demographic factors are
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37 presented in Table 1. Approximately two thirds (230/475, 67.4%) of the parents who reported
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39 providing sexuality education to their children were women. Almost eight in every ten parents
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41 (379/475, 79.8%) in the older age group (36-45 years) had spoken to their children about sexual
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43 matters. As evidenced in Table 1, both groups were broadly similar in terms of education level,
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45 those currently married and living with a spouse, locality, household social class and importance
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47 of religious beliefs. Parents who did not provide sexuality education to their children also had
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49 slightly smaller families in terms of the number of children.
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56 [Insert Table 1 about here]
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Propensity score analysis (PSA)

Table 2 presents characteristics of unmatched and matched samples, and balance improvement after propensity score matching. The results indicate that all variables improved their balance after matching except: casual relationship; no relationship; social class 3-4; and social class 7. (Note: the balance improvement for these variables was 0 or negative which suggests that the difference between both groups is greater than it was before the matching procedure. However, the covariates did not exceed 20% standardized absolute difference).

[Insert Table 2 about here]

Post-matching regression model

Post-matching hierarchical binary logistic regression analysis was employed to determine which covariates could be used to identify key characteristics that predict whether a parent reports that they (or their partner) provided sexuality education to their children. The first step of regression analysis (model 1) looked at the association between receipt of sexuality education and whether parents provided sexuality education. The results suggested that receiving sexuality education as a child does not predict whether the parent provided sexuality education (OR = 0.91; $p > .05$). The second step (model 2) consisted of entering interaction terms coding interaction between receipt of sex education and current age. The interactions between receipt of sex education and current age was statistically significant (OR = 1.79; $p < .05$), suggesting that the older parents (age group 36-45) who received sex education, in contrast to those who did not receive sex education, were more likely to provide sex education to their children compared with younger parents (21-35 years). The final step (model 3) consisted of entering all covariates: gender, education, current relationship status, number of children, locality, social class and religiosity. A

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3 test of the full model containing all predictor variables (and the interaction term between receipt
4 of sex education and current age) against constant-only model was statistically significant, $\chi^2(15,$
5 951) = 85.67, $p < .001$, indicating that the model was able to distinguish between parents who
6 reported providing sexuality education and those who did not. After controlling for all
7 covariates, the association between receipt of sex education and whether parents provided sex
8 education, moderated by current age, became statistically non-significant. As shown in Table 3,
9 only three of the independent variables made a unique statistically significant contribution to the
10 model. Results indicated current age as a significant predictor (OR = 1.87, $p < .05$). This
11 indicates that older parents (aged between 36-45 years) were more likely to report that either
12 they or their partner provided sexuality education to their children than those in the younger age
13 group (21-35 years), controlling for all other factors in the model. The second predictor
14 identified was gender (OR = 2.08, $p < .001$). This finding suggests that mothers were twice as
15 likely to report that they or their partner provided sexuality education compared to fathers. The
16 last statistically significant predictor was the number of children (OR = 1.18, $p < .05$). This
17 suggests that the more children a parent reported having, the more likely they were to have
18 spoken to them about sexual matters.
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45 Discussion

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48 This study aims to make a contribution to our knowledge of factors that predict parental
49 involvement in sexuality education in Ireland. Our findings suggest a need to advance our
50 knowledge in this field through the re-evaluation of appropriate research methods and analyses.
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55 Therefore, this section considers some of the key limitations of this study first, before a
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3 discussion of the main findings. A synthesis of what has been learned from this study based on
4 its strengths and limitations, with a view to advancing methods and analyses in sexuality
5 education research, concludes this section.
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11 One of the key limitations of this study was the wording of the question on whether
12 sexuality education was provided to children asked the respondent whether they *or their partner*
13 had provided sexuality education to their children. Thus, the predictors of whether sexuality
14 education was provided found in the current study may not be the predictors of the individual
15 who provided the sexuality education per se. In addition, as the sexuality education components
16 of this survey were part of a much broader investigation of crisis pregnancy and contraception,
17 the analyses and suppositions we can make are limited due to lack of information (e.g. the age of
18 the child/children at the time they received the sexuality education).
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31 This study identified a number of demographic factors that predicted parental
32 involvement in their child's sexuality education. First, parents who reported that they or their
33 partner had spoken to their children about sexual matters were more likely to be female, aged
34 between 36-45 years and have a larger number of children. Therefore, mothers, older parents,
35 and those with increasing numbers of children, are more likely report that they (or their partner)
36 have engaged in sexuality education with their children. These findings support previous
37 research which has highlighted the link between parental age, gender, and number of children
38 with the increased likelihood of engaging in sexuality education with children (Byers, Sears and
39 Weaver 2008; Turnbull, van Wersch and van Schaik 2008; Walker 2001). For example, parents
40 generally engage in more sexuality education with their older children (Weaver et al. 2002). In
41 our sample, it is plausible to assume that some of the children of the older parents were
42 chronologically older than those of the younger parents. Thus, it is more likely that these older
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3 parents would have provided some degree of sexuality education to their children at the time the
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5 data was collected.
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9 Linked to this was the finding that parents who had a higher number of children were also
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11 more likely to have engaged in sexuality education. It is possible the experience of parenting
12
13 more than one child may have made these parents more willing and more open to
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15 communication with their children about sexual matters; a factor that has been previously found
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17 to influence whether parents provided sexuality education (Walker 2001). Alternatively, this
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19 communication may have been child-led, as a result of subsequent pregnancies that prompted the
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21 older child/children to enquire about sexual reproduction.
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26 Due to the health risks associated with inconsistent safe sex practices, young people's
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28 sexuality has transitioned from the domain of the private family sphere to a pressing public
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30 health issue (Sprecher, Harris and Meyers 2008). Parents have an enduring and empirically
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32 supported role in influencing adolescent risk-taking behaviours (Resnick et al. 1997). More
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34 recently, a review by Yu (2010) on school-based sex education and the role of social factors in
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36 influencing teenage sexual behaviour, reiterated the critical role of parents' in making sex
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38 education more effective. Broadly speaking, the basis for our empirical knowledge on the
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40 involvement of parents in sexuality education is predominantly based on findings from two
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42 research sources: national health or sexual health surveys that embed items related to parents,
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44 children and sexuality education (e.g. NATSAL (UK), National Centre for Social Research et al.
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46 2005; National Survey of Family Growth (US), Martinez, Abma & Copen, 2010) or smaller
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48 scale qualitative studies that explore the experiences of parents' in providing sexuality education
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50 or assessing their participation in programmes/interventions designed to increase their
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52 engagement in this activity(e.g. Kesterton and Coleman, 2010; Weaver et al., 2002; Hyde et al,
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3 2010). Given parents integral role, sexuality education research would benefit from being
4 developed further.
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9 The key contributions of this paper emerge from both its strengths and its limitations.
10 One of the strengths of this study was the large nationally representative cross-sectional sample.
11 This quality is important as it is reflective of the type of individuals for whom sexual health
12 issues and sexuality education planning for the future is most relevant (McBride, Morgan and
13 McGee 2012b). Pioneering recruitment strategies also demonstrated the feasibility of using
14 mobile telephones in general population health surveys, and as well as contributing to the high
15 response rate of 69% (McBride, Morgan and McGee 2012b). This study also benefited from the
16 application of a novel statistical technique designed to overcome the problem of selection bias in
17 cross-sectional studies (propensity score analysis). This meant that comparisons made between
18 parents from the treatment (those who received sex education) and control (those who did not
19 receive sex education) group were as similar as possible. The application of this statistical
20 technique appears to be a worthwhile contribution to improving statistical analyses in this field.
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38 The limitations of the questions included on sexuality education in this survey highlight
39 the limitations of embedding these in sexual health surveys in general. Sexuality education,
40 including the role of parents, very often competes for space in these surveys with various other
41 pressing public health topics (e.g. contraception use, sexual health screening behaviour). Future
42 research should consider assessing parental involvement in sexuality education in a national
43 stand-alone survey format that could generate novel and informative data in this area. Detailed
44 information of this nature, on a national level, would provide a comprehensive knowledge base
45 that could inform educational curriculum planning and health services policy in the area. For
46 example, little is known, in a comprehensive way, about who provides sexuality education in the
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3 home. Furthermore, there is a lack of information on the type and range of topics discussed, the
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5 individual or familial reasons why certain topics are discussed and others are not discussed, and
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7 the manner and media in which sexuality information is provided (i.e. ‘the birds and the bees
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9 talk’; books; other media etc.).
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13 In conclusion, the findings reported identified parental age, gender and the number of
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15 children as key predictors in the likelihood of a parent, or their partner, speaking to their children
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17 about sexual matters. These findings have also highlighted the need to advance the field of
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19 sexuality education research. The effective recruitment methodology demonstrates a successful
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21 way of securing robust sample numbers on a national level for sensitive research such as this.
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23 The application of advanced statistical methods demonstrates a technique to overcome some of
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25 the limitations presented by cross-sectional data. Future research should incorporate these factors
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27 into the design of a national assessment of parental involvement in sexuality education with a
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29 view to elucidating a more comprehensive profile of parents and the level and nature of sexuality
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31 education they engage in.
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References

- Austin, P.C. 2008. A critical appraisal of propensity score matching in the medical literature between 1996 and 2003. *Statistics in Medicine* 27: 2037–2049.
- Boethel, M. 2003. *Diversity: School, family and community connections. Annual synthesis 2003*. Austin, TX: South-West Educational Developmental Laboratory.
- Byers, E.S, Sears, H.A, and Weaver, A.D. 2008. Parents' reports of sexual communication with children in kindergarten to Grade 8. *Journal of Marriage and Family* 70:86-96.
- Byrne, D. and Smyth, E. 2010. *Behind the scenes? A study of parental involvement in post-primary education*. Dublin: Liffey Press/ESRI.
- D'Agostino, R.H. 1998. Propensity score methods for bias reduction in the comparison of a treatment to a nonrandomized control group. *Statistics in Medicine* 17: 2265-2281.
- Fan, X. and Chen, M. 2001. Parental involvement and students' academic achievement: A meta-analysis. *Journal of Experimental Education* 70:27-61.
- Guo, S. and Fraser, M. W. 2010. *Propensity Score Analysis: Statistical Methods and Applications*. Los Angeles: Sage Publications.
- Holland, J., Mauthner, M. and Sharpes, S. 1996. *Family matters communicating health messages in the family. Family Health Research Reports*. London: Health Education Authority.
- Hyde, A., Carney, M., Drennan, J., Butler, M., Lohan, M., and Howlett, E. 2010. The silent treatment: Parents narratives of sexuality education with young people. *Culture, Health & Sexuality*, 12(4), 359-371.
- Ingham, R. 2002. "The role of parents in sex education" in Health Education Board of Scotland (ed.) *Young people and sexual health: Report of a deliberative seminar*. Edinburgh: Health Education Board for Scotland.
- Kesterton, D., and Coleman, L. 2010. Speakeasy: A UK-wide initiative raising parents' confidence and ability to talk about sex and relationships with their children. *Sex Education*, 10(4): 437-448.

- 1
2
3 Loeber, O., Reuter, S., Apter, D., van der Doef, S., Lazdane, G. and Pinter, B. 2010. Aspects of sexuality
4 education in Europe – Definitions, differences and developments. *The European Journal of*
5 *Contraception and Reproductive Health Care* 15: 169-176. doi: 10.3109/13625181003797280
6
7
8
9
10 Loughran, T. A., Mulvey, E. P., Schubert, C. A., et al. 2010. Differential effects of adult court transfer on
11 juvenile offender recidivism. *Law and Human Behavior* 34: 476–488.
12
13
14 Matinez, G., Abma, J., and Copen, C. 2010. *Educating teenagers about sex in the United States NCHS*
15 *data brief, No. 44*. Hyattsville, MD: National Center for Health Statistics.
16
17
18
19 Maycock, P., Kitching, K. and Morgan, M. 2007. RSE in the Context of SPHE: An Assessment of the
20 Challenges to Full Implementation of the Programme in Post-primary Schools. Summary Report,
21 Dublin: Crisis Pregnancy Agency.
22
23
24
25 McBride, O., Morgan, K. and McGee, H. 2012a. *Irish Crisis Pregnancy and Contraception Study 2010*
26 *(ICCP-2010): A survey of the general population*. Dublin: HSE Crisis Pregnancy Programme.
27
28
29
30 McBride, O., Morgan, K. and McGee, H. 2012b. Recruitment using mobile telephones in an Irish general
31 population sexual health survey: Challenges and practical solutions. *BMC Medical Research*
32 *Methodology* 12: 45.
33
34
35
36 McCrory, C. and Layte, R. 2011. The effect of breastfeeding on children's educational test scores at nine-
37 years of age: results of an Irish cohort study. *Social Science & Medicine* 72: 1515-1521.
38
39
40 National Centre for Social Research et al. 2005. *National Survey of Sexual Attitudes and Lifestyles II,*
41 *2000-2001*. Colchester, Essex: UK Data Archive.
42
43
44
45 Parker, R., Wellings, K. and Lazarus, J.V. 2009. Sexuality education in Europe: An overview of current
46 policies. *Sex Education* 9:227-242.
47
48
49
50 Phares, V., Fields, S. and Kamboukos, D. 2009. Fathers' and mothers' involvement with their adolescents.
51 *Journal of Child and Family Studies* 18: 1-9.
52
53
54
55
56
57
58
59
60

- 1
2
3 Resnick, M.D., Bearman, P.S., Blum, R.W., Bauman, K.E., Harris, K.M., Jones, J., Tabor, J., Beuhring,
4
5 T., Sieving, R.E., Shew, M., Ireland, M., Bearinger, L.H. and Udry, J.R. 1997. Protecting
6
7 adolescents from harm: Findings from the national longitudinal study on adolescent health.
8
9
10 *Journal of the American Medical Association* 278:823-832.
- 11
12 Rosenbaum, P. R. and Rubin, D. B. 1985. Constructing a control group using multivariate matched
13
14 sampling methods that incorporate the propensity score. *The American Statistician* 39: 33–38.
- 15
16
17 Rudner, L. M., & Peyton, J. 2006, May. *Consider Propensity Scores to Compare Treatments*. Research
18
19 Report RR-06-07. Graduate Management Admissions Council, McLean, VA.
- 20
21
22 Rundle, K., Layte, R. and McGee, H. (2008). *The Irish Study of Sexual Health and Relationships - Sub-*
23
24 *Report 1: Learning about sex and first sexual experiences*. Dublin: The Crisis Pregnancy Agency
25
26 and the Department of Health and Children.
- 27
28
29 Sprecher, S., Harris, G. and Meyers, A. 2008. Perceptions of sources of sex education and targets of sex
30
31 communication: Socio-demographic and cohort effects. *Journal of Sex Research* 45: 17-26.
- 32
33
34
35 Turnbull, T., van Wersch, A. and van Schaik, P. 2008. A review of parental involvement in sex education:
36
37 The role for effective communication in British families. *Health Education Journal* 67: 182-195.
- 38
39
40 Walker, J.L. 2001. A qualitative study of parents' experiences of providing sex education for their
41
42 children: The implications for health education. *Health Education Journal* 60: 132-146.
- 43
44
45 Walker, J.L. 2004. Parents and sex education - looking beyond 'the birds and the bees'. *Sex Education* 4:
46
47 239-254.
- 48
49
50
51 Weaver, A.D., Byers, E.S., Sears, H.A., Cohen, J.N. and Randall, H.E.S. 2002. Sexual education at school
52
53 and at home: Attitudes and experiences of New Brunswick parents. *Canadian Journal of Human*
54
55 *Sexuality* 11: 19-31.
- 56
57
58
59
60

1
2
3 Wellings, K. and Parker, R. 2006. *Sexuality Education in Europe: A reference guide to policies and*
4
5 *practices*. Belgium: International Planned Parenthood Federation European Network.
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
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For Peer Review Only

Table 1: Socio-demographic characteristics of parents who did and did not provide sexuality education to their children

	Parents who provided sexuality education (<i>n</i> = 475)		Parents who did not provide sexuality education (<i>n</i> = 488)	
	Unweighted N (%)	Weighted %	Unweighted N (%)	Weighted %
Gender				
Men	155 (32.6)	33.2	230 (47.1)	48.1
Women	230 (67.4)	66.8	258 (52.9)	51.9
Current age				
18-35 years	96 (20.2)	19.7	182 (37.3)	36.7
36-45 years	379 (79.8)	80.3	306 (62.7)	63.3
Education level				
Pre Leaving Cert.	85 (17.9)	25.3	98 (20.1)	30.3
Leaving Cert. or higher	390 (82.1)	74.7	390 (82.1)	69.7
Relationship status				
Married (and living with spouse)	361 (76.2)	79.0	353 (72.3)	75.9
Cohabiting	34 (7.2)	5.7	52 (10.7)	9.2
Steady relationship (not cohabiting)	19 (4.0)	3.6	18 (3.7)	2.2
Casual relationship	14 (2.9)	2.3	8 (1.6)	1.9
Not in a relationship	45 (9.5)	9.1	53 (10.9)	9.3
Number of children^a				
1-2	219 (46.1)	45.6	283 (58.0)	56.7
3-4	230 (48.4)	47.5	190 (38.9)	39.8
5 plus	23 (4.8)	6.2	15 (3.1)	3.5
Locality				
Urban	179 (37.7)	38.7	180 (36.9)	36.8
Rural	296 (62.3)	61.3	308 (63.1)	63.2
Household social class				
Social Class 1-2	168 (35.4)	29.6	188 (38.5)	31.0
Social Class 3-4	170 (35.8)	38.0	178 (36.5)	37.9
Social Class 5-6	55 (11.6)	12.1	46 (9.4)	12.7
Social Class 7	82 (17.3)	20.4	76 (15.6)	18.4
Religiosity^b				
Important	265 (55.8)	57.2	285 (58.4)	61.2
Don't know/Neither	49 (10.3)	10.3	57 (11.7)	10.8
Not important	161 (33.9)	32.5	146 (29.9)	28.0

Note. ^a Variable contains minimal levels of missing data. ^b For brevity the levels of religiosity were recoded into three categories.

Table 2: Characteristics of unmatched and matched sample, and balance improvement after propensity score matching

	Means before matching			Means after matching			% Balance Improvement
	R	NR	Mean difference	R	NR	Mean difference	
Distance (propensity score)	0.61	0.57	0.04	0.61	0.61	0.00	99.81%
Gender	0.63	0.56	0.06	0.63	0.67	0.04	15.66%
Current age	0.66	0.79	-0.13	0.66	0.64	0.02	91.16%
Education	0.18	0.20	-0.02	0.18	0.17	0.01	49.25%
Married	0.71	0.79	-0.08	0.71	0.73	0.02	78.35%
Cohabiting	0.10	0.07	0.03	0.10	0.09	0.01	56.93%
Steady relationship	0.05	0.03	0.02	0.05	0.05	0.00	63.21%
Casual relationship	0.02	0.02	0.00	0.02	0.03	-0.01	-31.97%
No relationship	0.11	0.09	0.02	0.11	0.09	0.02	0%
Number of children	2.43	2.64	-0.21	2.43	2.53	-0.10	51.24%
Locality	0.40	0.33	0.07	0.40	0.39	0.01	88.16%
Religiosity	2.84	2.71	0.13	2.84	2.80	0.04	70.58%
Social class 1-2	0.37	0.36	0.01	0.37	0.37	0.00	33.37%
Social class 3-4	0.34	0.38	-0.04	0.34	0.38	-0.04	0%
Social class 5-6	0.12	0.09	0.03	0.12	0.11	0.01	80.79%
Social class 7	0.16	0.17	-0.01	0.16	0.14	0.02	-64.17%
Sex education provided	0.48	0.51	-0.03	0.48	0.49	-0.01	49.95%

Note. R = Participants who received sex education; NR = Participants who did not received sex education

Table 3. Post-matching hierarchical binary logistic regression on the predictors of provision of sexuality education

Model	Variables	Unadjusted OR	Adjusted OR (95% CI)	SE
1	Sexuality education received	-0.09	0.91(0.70/1.18)	0.13
2	Sexuality education received	-0.42	0.66 (0.44/1.07)	0.22
	Current age		1	
	21-35 years			
	36-45 years	0.48	1.63* (1.00/2.68)	0.25
	Sexuality education received by Age	0.58	1.79* (0.97/3.30)	0.31
3	Sexuality education received	-0.40	0.67 (0.39/1.16)	0.27
	Current age		1	
	21-35 years			
	36-45 years	0.62	1.87* (1.11/3.17)	0.26
	Sexuality education received by Age	0.53	1.70 (0.90/3.19)	0.32
	Gender		1	
	Men			
	Women	0.73	2.08*** (1.58/2.75)	0.14
	Education level		1	
	Leaving Cert. or higher			
	Pre-leaving cert	-0.12	0.88 (0.61/1.27)	0.18
	Relationship status		1	
	Married			
	Cohabiting	-0.07	0.93 (0.56/1.54)	0.25
	Steady relationship	0.34	1.41 (0.69/2.90)	0.36
	Casual relationship	0.75	2.12 (0.84/5.71)	0.48
	No relationship	-0.04	0.96 (0.59/1.55)	0.24
	Number of children	0.16	1.18** (1.05/1.33)	0.15
	Locality		1	
	Rural			
	Urban	0.17	1.18 (0.89/1.56)	0.06
	Social Class		1	
	Social Class 1-2			
	Social Class 3-4	0.15	1.16 (0.85/1.60)	0.16
	Social Class 5-6	0.30	1.35 (0.84/2.19)	0.24
	Social Class 7	0.34	1.41 (0.92/2.17)	0.21
	Religiosity	-0.04	0.96 (0.87/1.07)	0.05

Note. OR = Odds ratio; CI = Confidence interval; SE = Standard error; SC = Social class.

* $p < .05$; ** $p < .01$; *** $p < .001$